



$$I(J^P) = \frac{1}{2}(\frac{1}{2}^+) \text{ Status: } ***$$

According to the quark model, the  $\Xi_c^0$  (quark content  $dsc$ ) and  $\Xi_c^+$  form an isospin doublet, and the spin-parity ought to be  $J^P = 1/2^+$ . None of  $I$ ,  $J$ , or  $P$  has actually been measured.

## $\Xi_c^0$ MASS

The fit uses the  $\Xi_c^0$  and  $\Xi_c^+$  mass and mass-difference measurements.

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
<b>2471.0 <math>\pm</math> 0.4 OUR FIT</b>				
<b>2471.09 <math>\pm</math> 0.35 OUR AVERAGE</b>				
2471.0 $\pm$ 0.3 $\pm$ 0.2	8620 $\pm$ 355	<sup>1</sup> LESIAK	05 BELL	$e^+ e^-$ , $\gamma(4S)$
2470.0 $\pm$ 2.8 $\pm$ 2.6	85	FRABETTI	98B E687	$\gamma$ Be, $\bar{E}_\gamma = 220$ GeV
2469 $\pm$ 2 $\pm$ 3	9	HENDERSON	92B CLEO	$\Omega^- K^+$
2472.1 $\pm$ 2.7 $\pm$ 1.6	54	ALBRECHT	90F ARG	$e^+ e^-$ at $\gamma(4S)$
2473.3 $\pm$ 1.9 $\pm$ 1.2	4	BARLAG	90 ACCM	$\pi^- (K^-)$ Cu 230 GeV
2472 $\pm$ 3 $\pm$ 4	19	ALAM	89 CLEO	$e^+ e^-$ 10.6 GeV
<b>• • • We do not use the following data for averages, fits, limits, etc. • • •</b>				
2462.1 $\pm$ 3.1 $\pm$ 1.4	42	<sup>2</sup> FRABETTI	93C E687	See FRABETTI 98B
2471 $\pm$ 3 $\pm$ 4	14	AVERY	89 CLEO	See ALAM 89

<sup>1</sup> The systematic error was (wrongly) given the other way round in LESIAK 05.

<sup>2</sup> The FRABETTI 93C mass is well below the other measurements.

## $\Xi_c^0 - \Xi_c^+$ MASS DIFFERENCE

VALUE (MeV)	DOCUMENT ID	TECN	COMMENT
<b>3.1 <math>\pm</math> 0.5 OUR FIT</b>			
<b>3.1 <math>\pm</math> 0.5 OUR AVERAGE</b>			
+2.9 $\pm$ 0.5	LESIAK	05 BELL	$e^+ e^-$ , $\gamma(4S)$
+7.0 $\pm$ 4.5 $\pm$ 2.2	ALBRECHT	90F ARG	$e^+ e^-$ at $\gamma(4S)$
+6.8 $\pm$ 3.3 $\pm$ 0.5	BARLAG	90 ACCM	$\pi^- (K^-)$ Cu 230 GeV
+5 $\pm$ 4 $\pm$ 1	ALAM	89 CLEO	$\Xi_c^0 \rightarrow \Xi^- \pi^+$ , $\Xi_c^+ \rightarrow \Xi^- \pi^+ \pi^+$

## $\Xi_c^0$ MEAN LIFE

VALUE ( $10^{-15}$ s)	EVTS	DOCUMENT ID	TECN	COMMENT
<b>112 <math>\pm</math> 13 OUR AVERAGE</b>				
118 $\pm$ 14 $\pm$ 5	110	LINK	02H FOCS	$\gamma$ nucleus, $\approx 180$ GeV
101 $\pm$ 25 $\pm$ 5	42	FRABETTI	93C E687	$\gamma$ Be, $\bar{E}_\gamma = 220$ GeV
82 $\pm$ 59 $\pm$ 30	4	BARLAG	90 ACCM	$\pi^- (K^-)$ Cu 230 GeV

## $\Xi_c^0$ DECAY MODES

No absolute branching fractions have been measured. Several measurements of ratios of fractions may be found in the Listings that follow.

Mode	Fraction ( $\Gamma_i/\Gamma$ )
$\Gamma_1 p K^- K^- \pi^+$	seen
$\Gamma_2 p K^- \bar{K}^*(892)^0$	seen
$\Gamma_3 p K^- K^- \pi^+ \text{ no } \bar{K}^*(892)^0$	seen
$\Gamma_4 \Lambda K_S^0$	seen
$\Gamma_5 \Lambda K^- \pi^+$	
$\Gamma_6 \Lambda \bar{K}^0 \pi^+ \pi^-$	seen
$\Gamma_7 \Lambda K^- \pi^+ \pi^+ \pi^-$	seen
$\Gamma_8 \Xi^- \pi^+$	seen
$\Gamma_9 \Xi^- \pi^+ \pi^+ \pi^-$	seen
$\Gamma_{10} \Omega^- K^+$	seen
$\Gamma_{11} \Xi^- e^+ \nu_e$	seen
$\Gamma_{12} \Xi^- \ell^+ \text{ anything}$	seen

## $\Xi_c^0$ BRANCHING RATIOS

$$\Gamma(p K^- K^- \pi^+)/\Gamma(\Xi^- \pi^+) \quad \Gamma_1/\Gamma_8$$

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
<b>0.34±0.04 OUR AVERAGE</b>				
0.33±0.03±0.03	1908 ± 62	LESIAK	05	BELL $e^+ e^-$ , $\gamma(4S)$
0.35±0.06±0.03	148 ± 18	DANKO	04	CLEO $e^+ e^-$

$$\Gamma(p K^- \bar{K}^*(892)^0)/\Gamma(\Xi^- \pi^+) \quad \Gamma_2/\Gamma_8$$

Unseen decay modes of the  $\bar{K}^*(892)^0$  are included.

VALUE	DOCUMENT ID	TECN	COMMENT
<b>0.210±0.045±0.015</b>	DANKO	04	CLEO $e^+ e^-$
• • • We do not use the following data for averages, fits, limits, etc. • • •			
seen	BARLAG	90	ACCM $\pi^- (K^-)$ Cu 230 GeV

$$\Gamma(p K^- K^- \pi^+ \text{ no } \bar{K}^*(892)^0)/\Gamma(\Xi^- \pi^+) \quad \Gamma_3/\Gamma_8$$

VALUE	DOCUMENT ID	TECN	COMMENT
<b>0.21±0.04±0.02</b>	DANKO	04	CLEO $e^+ e^-$

$$\Gamma(\Lambda K_S^0)/\Gamma(\Xi^- \pi^+) \quad \Gamma_4/\Gamma_8$$

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
<b>0.21±0.02 ±0.02</b>	465 ± 37	LESIAK	05	BELL $e^+ e^-$ , $\gamma(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
seen	7	ALBRECHT	95B ARG	$e^+ e^- \approx 10.4$ GeV

$$\Gamma(\Lambda K^- \pi^+)/\Gamma(\Xi^- \pi^+) \quad \Gamma_5/\Gamma_8$$

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
<b>1.07±0.12±0.07</b>	2979 ± 211	LESIAK	05	BELL $e^+ e^-$ , $\gamma(4S)$

$\Gamma(\Lambda\bar{K}^0\pi^+\pi^-)/\Gamma_{\text{total}}$

VALUE	DOCUMENT ID	TECN	COMMENT
<b>seen</b>	FRABETTI	98B E687	$\gamma$ Be, $\bar{E}_\gamma = 220$ GeV

$\Gamma_6/\Gamma$

$\Gamma(\Lambda K^-\pi^+\pi^+\pi^-)/\Gamma_{\text{total}}$

VALUE	DOCUMENT ID	TECN	COMMENT
<b>seen</b>	FRABETTI	98B E687	$\gamma$ Be, $\bar{E}_\gamma = 220$ GeV

$\Gamma_7/\Gamma$

$\Gamma(\Xi^-\pi^+)/\Gamma(\Xi^-\pi^+\pi^+\pi^-)$

VALUE	DOCUMENT ID	TECN	COMMENT
<b>0.30±0.12±0.05</b>	ALBRECHT	90F ARG	$e^+e^-$ at $\gamma(4S)$

$\Gamma_8/\Gamma_9$

$\Gamma(\Omega^-\bar{K}^+)/\Gamma(\Xi^-\pi^+)$

VALUE	EVTS
<b>0.297±0.024 OUR AVERAGE</b>	
0.294±0.018±0.016	650
0.50 ± 0.21 ± 0.05	9

$\Gamma_{10}/\Gamma_8$

$\Gamma(\Xi^-\bar{e}^+\nu_e)/\Gamma(\Xi^-\pi^+)$

VALUE	EVTS
<b>3.1±1.0±0.3</b>	54

$\Gamma_{11}/\Gamma_8$

$\Gamma(\Xi^-\ell^+\text{anything})/\Gamma(\Xi^-\pi^+)$

$\Gamma_{12}/\Gamma_8$

The ratio is for the *average* (not the sum) of the  $\Xi^- e^+$  anything and  $\Xi^- \mu^+$  anything modes.

VALUE	EVTS
<b>0.96±0.43±0.18</b>	18

DOCUMENT ID	TECN	COMMENT
ALBRECHT	93B ARG	$e^+e^- \approx 10.4$ GeV

$\Gamma(\Xi^-\ell^+\text{anything})/\Gamma(\Xi^-\pi^+\pi^+\pi^-)$

$\Gamma_{12}/\Gamma_9$

The ratio is for the *average* (not the sum) of the  $\Xi^- e^+$  anything and  $\Xi^- \mu^+$  anything modes.

VALUE	EVTS
<b>0.29±0.12±0.04</b>	18

DOCUMENT ID	TECN	COMMENT
ALBRECHT	93B ARG	$e^+e^- \approx 10.4$ GeV

## $\Xi_c^0$ DECAY PARAMETERS

See the note on “Baryon Decay Parameters” in the neutron Listings.

$\alpha$  FOR  $\Xi_c^0 \rightarrow \Xi^-\pi^+$

VALUE	EVTS
<b>-0.56±0.39±0.10</b>	138
<b>-0.09</b>	

DOCUMENT ID	TECN	COMMENT
CHAN	01 CLE2	$e^+e^- \approx \gamma(4S)$

## $\Xi_c^0$ REFERENCES

AUBERT,B	05M	PRL 95 142003	B. Aubert <i>et al.</i>	(BABAR Collab.)
LESIAK	05	PL B605 237	T. Lesiak <i>et al.</i>	(BELLE Collab.)
Also		PL B617 198 (erratum)	T. Lesiak <i>et al.</i>	(BELLE Collab.)
DANKO	04	PR D69 052004	I. Danko <i>et al.</i>	(CLEO Collab.)
LINK	02H	PL B541 211	J.M. Link <i>et al.</i>	(FNAL FOCUS Collab.)
CHAN	01	PR D63 111102R	S. Chan <i>et al.</i>	(CLEO Collab.)
FRAEBETTI	98B	PL B426 403	P.L. Frabetti <i>et al.</i>	(FNAL E687 Collab.)
ALBRECHT	95B	PL B342 397	H. Albrecht <i>et al.</i>	(ARGUS Collab.)
ALEXANDER	95B	PRL 74 3113	J. Alexander <i>et al.</i>	(CLEO Collab.)
Also		PRL 75 4155 (erratum)	J. Alexander <i>et al.</i>	(CLEO Collab.)
ALBRECHT	93B	PL B303 368	H. Albrecht <i>et al.</i>	(ARGUS Collab.)
FRAEBETTI	93C	PRL 70 2058	P.L. Frabetti <i>et al.</i>	(FNAL E687 Collab.)
HENDERSON	92B	PL B283 161	S. Henderson <i>et al.</i>	(CLEO Collab.)
ALBRECHT	90F	PL B247 121	H. Albrecht <i>et al.</i>	(ARGUS Collab.)
BARLAG	90	PL B236 495	S. Barlag <i>et al.</i>	(ACCMOR Collab.)
ALAM	89	PL B226 401	M.S. Alam <i>et al.</i>	(CLEO Collab.)
AVERY	89	PRL 62 863	P. Avery <i>et al.</i>	(CLEO Collab.)